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Verbal concept attainment of schizophrenics as related to mild verbal censure.

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VERBAL CONCEPT ATTAINMENT OF SCHIZOPHRENICS AS RELATED TO MILD VERBAL CENSURE

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Introduction

Purpose

The purpose of this study is to investigate verbal concept attainment in good premorbid schizophrenics, poor premorbid schizophrenics, and normals when the experimental condition of mild verbal censure is introduced. The verbal concept task will include modifications of the Wechsler-Bellevue Similarities sub-test, developed by Webb (1955).

This study is based upon a previously reported research by Webb (1955) and a number of works reported by Rodnick and Garmezy (1957), as well as upon the theoretical formulations of Cameron, Sullivan, Goldstein, and others. It is hoped that the findings and interpretations of the Webb research may be clarified and extended to give a clearer meaning to present theories of schizophrenia, to verbal conceptual processes in schizophrenia and to the effect of mild verbal censure on verbal conceptual processes in schizophrenic thinking.

Cameron, Sullivan, and Goldstein see schizophrenia as involving a reaction to a serious interpersonal disturbance in the early formative years of life. There follows a high sensitivity to stimuli that would threaten personal security. Because of this high sensitivity to interpersonal cues of a threatening nature, the schizophrenics, as compared to normals, are prone to more private ways of thinking. One result is a deficit in verbal conceptual ability.

Other writers have also stressed the general idea that what is involved in schizophrenic thought is a return of prelogical conceptions. These infantile conceptions are seen to enter into the more complex

adult logical thinking. For Fenichel (1945), schizophrenic thinking is a regression to a prelogical type of thought, an archaic way of thinking. "Schizophrenic logic is identical with primitive, magical thinking ... " (Fenichel, 1945, p.421). Fenichel further states that, "Whenever reality becomes unpleasant, more pictorial daydream substitutes are sought", rather than the more adult type of "objective intelligence". (1945,p.51)

Theories of Schizophrenia

Cameron's Biosocial Theory:

Cameron (1947) declares that there has been a progressive "disorganization" and "desocialization" in the schizophrenic. The schizophrenic has evolved highly idiosyncratic ways of thinking and talking which tend to be incommunicable. He asserts that schizophrenia is a reaction on the person's part to his recognized inability to play roles required of him by his family and his culture. The schizophrenic has experienced chronic insecurity in interpersonal relations in early childhood and later life. His reaction is to overinclude his personal fantasies into his social relations. Because he has not had the support of significant persons during his early development, he tends to withdraw from perceived threatening situations and from reality testing activities. This is accompanied by idiosyncratic fantasy which brings about disruptions in socially appropriate verbalizations. Cameron (1947) states, "Because schizophrenia is a disorganizing and desocializing disorder, it could be predicted that the chief instrument of interpersonal communication, talking, would suffer from and contribute to the disorganization and desocialization of the individual." (p.464)

Sullivan's Interpersonal Theory:

Sullivan states (1956) that in schizophrenia there is a loss of control over the early referential processes and these processes come to dominate consciousness. For the normal and the schizophrenic, these modes of thinking (the early referential processes) are characteristic of an early period of life and are basically incommunicable. It follows that, if these processes come to dominate consciousness, as in schizophrenic thinking, verbal conceptual abilities will show a deficit. As a person becomes socialized, he eliminates aspects of these referential processes from consciousness and learns to take on consensually validated ways of thinking. The schizophrenic fails to do this as effectively as the normal, and one result is his inability to perform adequately on tasks requiring conventional verbal conceptualization. For the schizophrenic, the early referential processes, according to Sullivan, are most likely to appear in situations which threaten interpersonal security, or self esteem and are anxiety provoking.

Goldstein's "Organismic" Theory:

The work on conceptual behavior by Goldstein and Scheerer (1941) resulted in their view that there were two levels of behavior. These were: 1. the abstract, and 2. the concrete. The normal was seen as being able to assume both voluntarily, but the brain-damaged person was more likely to utilize the concrete approach. These two levels, in fact, were spoken of by Goldstein and Scheerer (1941) as being "capacity levels of the total personality". With the concrete attitude, the person responds to the separate and unique aspects of a situation.

Goldstein (1951) sees this mode as "realistic", and binding the person to the immediate experience.

It is of primary concern to note here the effects of concreteness on verbal concept formation. If we operationally define verbal concept formation as that which is measured by such tasks as the similarities subtest of the Wechsler-Bellevue, then an increase in concreteness (being bound to immediate stimuli) will lead to a deficit in performance. The empirical norms of the W-B show that concrete answers usually receive the least points and the abstract type the most points (Rapaport, 1945, p.149). On one hand, the concrete answer may be too limited, leaving out hundreds of such concrete ways of answering. On the other hand, the answer may be overinclusive. For example, if the answer to, "How are a dog and a lion alike?", is "They both have hair", it might be said that humans, cats, etc., also have hair. Rapaport feels that the concrete answer may at times have pathological significance.

In contrast to the concrete approach, the abstract attitude is the basis for the ability:

1. to assume a mental set voluntarily,
2. to shift voluntarily from one aspect of a situation to another,
3. to grasp the essential of a given whole, to break up a whole into parts and to voluntarily isolate them,
4. to keep in mind various aspects of a situation,
5. to generalize and plan ahead ideationally, and
6. to maintain a discrimination for a length of time.

Because of his work with brain damaged persons, Goldstein (1941) spoke of an impairment in the abstract attitude. Later, he (1943) spoke of some schizophrenics who were also unable to assume this abstract attitude. However, as it has been often misconstrued, Goldstein

did not mean to restrict himself to an organic etiological explanation of schizophrenia. Instead, the schizophrenic might be restricted to the concrete mode as a solution to his unbearable conflict. Further he felt that the concreteness of the schizophrenic reflected the personalized fantasy thinking of that person.

In 1959, Goldstein stated even more clearly his position about a psychological explanation of the concreteness in schizophrenic behavior. "Clinical observations reveal that the abnormally concrete behavior does not come to the fore under all conditions, that the same schizophrenic sometimes shows impairment of abstraction and sometimes does not, and that the change depends on the demands the patient is confronted with. I became inclined to consider the concreteness of the schizophrenics as a protective mechanism against anxiety which originated in early youth". Further he states, "Persons who later become schizophrenics retain the habit of reacting to dangerous situations with abnormal concreteness... The abnormal concreteness of the schizophrenic appears thus as a secondary phenomenon; it is not the effect of an organic defect...." (Goldstein, 1959, p.147)

In summary, it would seem then that these three theorists would agree that the disorder is a reaction to a threatening interpersonal situation in early childhood and that there is developed a "sensitivity" to interpersonal stimuli, particularly to the type that would suggest a threat to personal security. It would follow that because there is an oversensitiveness to cues that would threaten personal security, certain disrupting factors interfere with the adequate thinking and verbalizations

of schizophrenics, and this in turn would lead to a deficit in verbal concept attainment tasks.

Schizophrenic Verbalization and the Significance of Verbal Concept Formation

Rapaport (1945) discusses the psychological processes involved in verbal concept formation. "Concept formation is the function which informs the human being about the 'belonging together' of the objects and events of his everyday world", and further, "Each word with which one names an object implies an automatic concept formation." Most concept formations take place with little effort. When the unknown or the emotionally trying are met then concept formation stops being so automatic. Rapaport writes, "Affective orientations and attitudes build the world of the individual...That is structure it in patterns of conceptual coherence, into which he organizes new experiences automatically when the patterns are not disrupted by the enroachment of maladjustment". (p.147)

Past experience with schizophrenia has made it clear that one way this mental maladjustment makes itself known is by impairment in the ability to verbalize and conceptualize in ways that are common to social expectation. A great deal of literature deals with the subject of the schizophrenic's disorganized verbalization processes. Rapaport (1945) states "that concept formation is one of the main channels through which maladjustment encroaches upon thinking, and that in it we may be able to discover early traces of impending maladjustment". This maladjustment may be the result of the enroachment of autistic and uncommunicable primary process thinking into consciousness and/or a defense against such enroachment.

We will now briefly look at a possible rationale concerning verbal concept formation as measured by the Similarities Test. Rapaport (1945) points up some major considerations. In this test there are only two items to be dealt with at a time and the subject must tell us the common content of these items. Rapaport comments, "The narrowness of the realm is such that the process of concept formation requires only a minimum of interaction of inductions and deductions, and is experienced as automatically occurring." We would then expect the performance to go easily, with little effort. However, when there are only two items to be dealt with, there is emphasized a tendency to respond with concrete or functional type answers. When more items must be taken into account then, "The average subject is driven to a more and more abstract attitude toward them."

The next point is that the task is a purely verbal one, and the answers which are given are for the most part established in everyday experience between the objects and their generic forms. "Therefore, as long as the S's 'verbal coherence' is functioning the task should be a relatively simple one." If the verbal coherence has never been established or is weakened then two possibilities follow. The subject may make direct reference to images of the objects and this will lead to concrete type answers. Besides this he may attempt generalizations and these may become over-encompassing.

The final point that Rapaport makes is that, "These verbal coherences become so stereotyped and ingrained in an individual's thinking that profound impairment or even deterioration of active concept formation may

leave them untouched. Thus a good score on Similarities may be the result of the perseverance of these empty shells of concepts." It should be noted, that the schizophrenics verbal conceptual formulations have been found to be rigid, and the verbal coherence due to this perseverance will not be expected for all pairs; only for those in very common everyday experience.

Schizophrenic Performance on Verbal Conceptual Tasks

Many studies have consistently shown the presence of a deficit in the verbal conceptual performances of schizophrenics. The most significant studies will now be briefly reviewed. The tasks of these studies involved the ability to manipulate verbal concepts.

A study by Wegrocki (1940) used children (ages 10-14), normal adults, and schizophrenics. The tasks comprised proverb tests, analogies tests, and an essential similarities test, and the author concluded that in some of the schizophrenics there was shown to be an impaired ability to generalize when they were compared with normal adults. This study would seem to refute the idea of a regression to a preconceptual level of thinking. When the schizophrenic's and children's performances were compared, there were qualitative differences in the types of errors made. Wegrocki also reports that under conditions of good rapport some schizophrenics could operate effectively with abstract conceptual verbalizations in a way that had at first seemed impossible for them. Also he found that with mere repetition of the tasks there was some improvement in the schizophrenic's performances.

In a study using 62 schizophrenics and 95 normals, by Hanfmann

and Kasanin (1938), the concept of a regression to a preconceptual level of thinking was used to explain the conceptual deficits of the schizophrenics. They state, "The schizophrenic is not able to grasp certain general principles or the idea of classification according to certain principles, and frequently develops other principles, and other classifications than those which the average person adopts."

In a study by Feldman and Drasgow (1951) on concept formation in schizophrenics, they describe a visual-verbal test in which they gave cards with four pictures on each to schizophrenic and normal groups. Two concepts could be formed: (1) A concrete type and (2) An abstract type. The concrete performance was defined as being only an identification of the pictures. The abstract performance consisted in relating the material to a conceptual category. This supported a deficit in conceptualization by the schizophrenics in that their typical mode was a concrete one. They found the test yielded non-overlapping distributions for the schizophrenics and normals studied, and the deficit in conceptual ability was explained as a primitive ego defense mechanism protecting the schizophrenics from anxiety.

Flavell (1956) in a study with schizophrenics and normals gave each a series of cards that had a stimulus word and two response words, one word having more of an abstract relationship with the stimulus word. He found that schizophrenics significantly chose the less abstract words, and this was further correllated positively with social adequacy as rated by ward nurses. Milgram (1959) using Flavell's test has worked with schizophrenics, organics, and normals. Organics were consistently

more concrete on the test, but schizophrenics also chose fewer abstract responses than normals.

Baker's study (1953) on the acquisition of verbal concepts in schizophrenia used a number of sentences in which artificial words were placed. The subjects (schizophrenics and normals) had to account for the meanings of these words in the context of the sentences. This author reports that schizophrenics gave fewer correct solutions, more immature ways of solving the tasks, and were significantly more concrete in their language.

Leventhal, McGaughran, and Moran (1959) used a number of tasks including the Similarities Test in a multivariable analysis of the conceptual behavior of schizophrenics and brain damaged patients. In general, their results would indicate that organics tend toward "under-abstraction" and the schizophrenics tended toward "over-abstraction," (that is, abstractness in an autistic way). Rashkis, Cushman, and Landis (1946) used a word sorting test which they administered to normal adults, children, paretics, and schizophrenics. The schizophrenic performances were marked by inconsistency and an inability to switch from one attitude to another. They feel that the schizophrenic can think in abstract terms, but that their logic is autistic. White (1949) also used word sorting tests with schizophrenics and normals. In addition, she compared their performance on the identification of words and on inventing sentences. She concludes, "In his language, the schizophrenic reveals his need to find complex and infinite relationships among what normals consider the specific, or the personal." Meadow, Greenblat, and

Solomon (1953) found by using a free verbalization task, that looseness of association was correlated positively with impairment in abstraction.

Harrington and Ehrmann (1954) found complexity of response is a factor in Wechsler-Bellevue vocabulary performances of schizophrenics. The patients gave significantly fewer abstract verbal answers than did normals, but on a multiple choice vocabulary test there was no significant difference between groups. They account for these findings as the influence of complexity of response. Moran has done extensive work with schizophrenics and their performance on vocabulary tests. In his 1953 paper he reports that on verbal tests of vocabulary knowledge and usage, schizophrenics were less able to put words together into coherent verbalizations, when compared with normals. This was the case even when the schizophrenics defined the words in the same way as the normals.

Cameron, too, has done extensive work with schizophrenics. On the basis of daily contact, test situations, and experimental investigation, he questions the usefulness, "to say nothing of the validity of these determined efforts to maintain separate categories of abstract and concrete behavior." (Cameron, 1944, p.903) However, there are times when the schizophrenic does operate in a concrete manner and at times in a "normal" manner, and what is important to try and understand are the circumstances under which these forms of behavior are likely to occur.

One characteristic that has been seen to be typical of schizophrenic thought is that of overinclusion. This idea has been supported by the findings of Cameron (1939), Payne, Mattussek, and George (1959),

Epstein (1953), and Chapman and Taylor (1957).

Cameron finds in the conceptual sortings of schizophrenics a notable tendency to overinclude extraneous environmental material and imaginal material related to personal fantasies (1939). The schizophrenics characteristically make generalizations that are too broad, complex, and mixed up with their own personal problem. Further, very little correspondence was found between their actual test performances and their verbalizations about their performances.

Payne, et al. (1959), gave a large battery of tests to schizophrenics and neurotics in an attempt to find if schizophrenic thinking impairment could best be described as concrete or overinclusive. The latter received the most support, and they interpret overinclusiveness to be the fundamental aspect of the thought disorganization seen in schizophrenia.

Chapman and Taylor (1957) also put forth evidence for an overinclusiveness. They interpret the overinclusiveness as being brought about by a "distractor" variable. Instead of being a basic loss of conceptual ability, there is seen to be an over-responsiveness to distracting stimuli in general.

Epstein (1953) also found evidence for overinclusive behavior being characteristic of schizophrenic thinking. Compared to a normal group, the schizophrenic group overincluded more on a task requiring the subject to select appropriate words to go with cue words; for example, "house", followed by "curtains", "telephone", "bricks", "roof", and "none". The subject was to pick the words that would go or belong most appropriately with the concept "house".

A review of the studies would then show that a deficit in the verbal conceptual performance of schizophrenics does at times exist, but that under certain conditions these performances are highly variable. These studies would indicate that this deficit may vary with certain factors in the experimental situation. It would seem important to explore certain of these meaningful conditions--at least some of them being motivational in nature.

Recent Conceptual Studies on the Effects of "Censure" and Anxiety

The Rodnick and Garmezy studies (1957) were based upon the following hypothesis: The schizophrenic patient is able to respond adaptively to tasks of great complexity, provided they are interested (motivated) to insure cooperation. If, however, a small amount of censure is introduced, the tenuous adaptability will be revealed and their behavior will show the characteristic schizophrenic deficit. On the basis of these studies, (see Dunn, 1954; Garmezy, 1952; Webb, 1955; and others), they interpret that even a "minimal punishment" of a social type has a deleterious effect on a wide variety of tasks (auditory and visual, discrimination, concept formation, verbal learning and recall, etc.).

Webb (1955) poses the possibility that the deficit in schizophrenic conceptualization may vary in relation to certain experimental conditions. He chose to analyze the factor of "stress". "Stress" in the study was defined as an induced feeling of failure or a "threat of failure". Specifically, after performing on a verbal concept formation task, the experimental Ss were told, "Off-hand, Mr.____, it 'looks like' you did worse than would have been expected of you. If you'll

wait a few moments, I'll score your answers, and we'll see." A two-minute waiting period was given, and then, "Well, I've scored your answers, Mr.____, and it turned out that you did worse than I had thought at first. I have another test here. Let's see how you do on it." The question , that Webb posed for this study, was whether the deficit in conceptual ability of schizophrenics could be varied as a function of "threat of failure".

For this study he used 52 males, white, hospitalized schizophrenics. There were 28 experimental Ss who received the above condition, and 24 control Ss. The control task was a Knox Cube Test. The groups were matched on vocabulary scores, education, age, and duration and subtype of their psychosis.

Similarity tests were developed from the Wechsler-Bellevue and were used as measures of concept attainment. Two alternate forms of 20 items each were constructed and used as pre- and post- tests in an alternate fashion. The responses of the Ss were rated so as to provide two kinds of measurements. One was "quality level" and reflected the usual W-B scoring method, and the second measurement was the presence in the responses of qualitative attributes frequently found in schizophrenic verbalizations. For this measurement two categories were used: (1) "Imprecision" or the omission of essential connectives or the substitution of approximate words and phrases in place of more definite ones. (2) "Tangentiality" was defined as material introduced which was not essential for evolving a similarity or where a response was concerned with only one of the units comprising an item.

The control group showed a significant improvement (.01) in score from the pre-test to the post-test on "quality level". The experimental group did not show an improvement but did show a non-significant decrease in "quality level". Further, in an analysis of trend differences (Kogan, 1948), the curves show the differences between the means of the two groups to be a progressive one and was significant at the .05 level. On the two measures, "tangentiality" and "imprecision", the results tended toward the predicted directions but were non-significant. (p.4,p.30)

From these results the author concludes, ".... The mild threat used in this study served to maintain a deficit in conceptual ability by blocking the operation of certain variables conducive to more efficient manipulation of the concepts." Further, this did not occur in the control group because with "....continuing experience and familiarity with the test situation and without encountering threat, (they) may have felt progressively more secure and consequently took more interest in the test." (p.223) Webb points out that the two most probable variables which could have led to an improvement in scores, as was seen in the performances of the control group, would be practice and motivational variables. Since the Ss that received the "stress" had the same amount and kind of practice as the control group, "....it seems unlikely that practice per se could account for the difference in the performance of the two groups."

It will be noted that of the two types of measurements used in this study, only one was found to be significant in the predicted

direction. The attributes of "imprecision" and "tangentiality" as defined by Cameron (1939) are usually seen as being more characteristic of schizophrenic verbalizations. Webb's results failed to show that these attributes increased as a function of "threat of failure". Hence, this study gives little support to "threat of failure" as possibly an antecedent condition of schizophrenic behavior. The usual quantitative method of scoring the Similarities test did reach significant results, but this lower "quality level" of performance cannot be said to be peculiar to schizophrenics alone. One vital drawback to Webb's study then is seen as his failure to include a normal group. It may be that normals under the same conditions would also perform in similar ways. Further, it is felt that the measurements of "imprecision" and "tangentiality" are not well defined and meaningfully clear as measurements and that other more precise measurements might have been utilized in studying the effects of "threat of failure" on schizophrenic verbal conceptualizations.

Cavanaugh (1958) gave white noise as an adversive stimulus to schizophrenics and normals while they were performing on both formal and social concept tasks. It was found that in conditions that would motivate escape from this noxious stimulus, the schizophrenics' performance approximated that of the normals on both tasks of formal and social content. The author states, "In schizophrenia, the patient's limited ability to handle stress leads to such abnormal behavior as withdrawal. The addition of new stress, more potent than the stresses which have led to schizophrenia, may at least temporarily reverse the

trend forward in inappropriate behavior and result in actions more similar to those of normals." It should be noted that in this study social censure was not used, but a physical noxious stimulus, and, therefore, perhaps we should not expect to see the same deficit in performance.

In a study by Wilensky (1952) he reports on the performance of schizophrenics and normals on a number of tasks (auditory memory, visual memory, etc.) following frustration. During the tasks when failure occurred, it was pointed out to the subject. The results showed that on the two memory tasks, "the mild stress situation was sufficient to reduce to some extent the scores of the normals, and to a significantly greater degree, also those of the schizophrenics." The poor performance of the schizophrenics following frustration as compared to normals was interpreted by this author as support for the idea that the former group has a lower frustration tolerance. They report that the schizophrenics' qualitative behavior also differed after frustration and was manifested in, "a greater tendency to abandon the tasks by refusing to respond and by spending less time with items."

A number of studies have dealt with the effects of anxiety on intellectual functioning. Beier (1951) reports on the effect of induced anxiety on flexibility in intellectual performances. To produce stress a group Rorschach test was given. A number of other tests were employed including a test of abstract reasoning. The author comes to this conclusion, "The findings of this study would indicate that individuals who are in a state of anxiety show a loss of the 'abstract'

abilities or, more specifically, face a loss in flexibility of intellectual function...." (p.19)

Heath (1956) reports on a study where, "Schizophrenics show significantly more response disorganization on abstract intellectual tasks under anxiety than under nonanxiety conditions; the amount of response disorganization is a function of the individual's pattern of differential thresholds of anxiety; the amount of response disorganization is inversely related to the degree of abstract conceptual ability." (p.407)

Tomblen (1957) also did a study on anxiety and conceptual deficit in schizophrenics. He reports that anxiety was shown to impair all aspects of the schizophrenic's performance on object sorting and picture sorting tasks. He concluded that the conceptual deficit is a reaction to and defense against anxiety.

A number of studies have dealt with the effect of emotional and non-emotional content upon verbal conceptualization. Richman (1957) measured vocabulary definitions given by schizophrenics to neutral and emotionally-toned words. Wexler (1955) found that schizophrenics showed relatively more conceptual thinking disturbance on emotionally-toned tasks when compared to normals. Whiteman (1954) studied schizophrenic and normal performance using formal and social concepts. Normals were found to perform significantly higher than schizophrenics on both formal and social concept tests. However, the schizophrenics' deficit was significantly greater on tasks involving social concepts. Whiteman interprets this greater deficit in terms of the effects of social

disarticulation upon cognitive functioning. In a later paper by Whiteman (1956) he describes some of the qualitative differences between the schizophrenics' performance and the normals'. The schizophrenics were prone to give more individualistic responses, more physicalistic or descriptive responses, rejected more items, and were vague in their conceptualizations.

A Measurement of Premorbid Adjustment

The schizophrenic Ss in this study will be separated into groups of good and poor premorbid patients by the use of the Phillips Scale. The purpose of separating the schizophrenics is based on the fact that the schizophrenic population is heterogeneous in nature. Consequently, generalizations are difficult to make about these patients. Empirical findings demonstrate that the premorbid scale predicts schizophrenic remission (Phillips, 1953). Webb in his study matched his schizophrenic groups as to the subtype of their psychosis. On the basis of the experimental results to be reviewed below, it is believed premorbidity adjustment is a better means of selecting homogeneous groups of schizophrenic subjects than subtype as in Webb's study (1955).

Rodnick and Garmezy (1957) were among the first to make use of this scale. They showed a basis for differentiating schizophrenics on this variable. They demonstrated that it was the poor premorbid group in Dunn's study (1954) that contributed most of the variance that was found between his schizophrenics and normals. Bleke (1955) in a study on reminiscence effects with poor and good premorbids and normals, has also found that premorbidity adjustment was a satisfactory basis for

differentiating schizophrenics. In this study the poor premorbids were found to perform significantly different than normals, and the good premorbids' performances approximated those of the normals. In two recent published studies on concept formation, Hellman (1961) and Moriarty (1962) utilized the Phillips Scale for dividing their schizophrenics into poor and good groups. Their results tend to confirm the above findings of Rodnick and Garmezy, and those of Bleke.

Statement of the Problem

The problem of this study was to compare verbal concept attainment, as measured by an elaboration of the Wechsler Similarities subtest, of good premorbid schizophrenics, poor premorbid schizophrenics, and normals under the experimental condition of mild verbal censure, and a neutral condition.

The theories of Cameron, Sullivan, and Goldstein lead to the hypothesis that schizophrenics, when compared to normals, would show a greater deficit in verbal similarities performance. This deficit should be reflected in verbal concept (similarities) scores and by language behavior that is indicative of primary process thinking, (e.g., fabulated, symbolic, split-narrow, syncretistic, and affective verbalizations). This hypothesis would tend to be supported by the findings of Cameron (1939), Wegrocki (1940), Feldman and Drasgow (1951), Baker (1953), Leventhol, McGaughran and Moran (1959), and others. Further, from the theories of Cameron, Sullivan, and Goldstein, we would expect that the greater the social disorganization, the greater the loss in verbal abstract capacity. The poor premorbid schizophrenics

show the greatest social disorganization as operationally measured by the Phillips Scale. Thus, logically the poors should perform least efficiently on tests of verbal abstraction, with goods a bit more efficiently, and normals most efficient. Hellman's results (1961) tend to support this logical development, in that he showed that poor premorbids, good premorbids, and normals could be distinguished on conceptual tasks, including both object sorting and verbalization.

If mild verbal censure is introduced into the testing situation, it would follow from the theories of Cameron, Sullivan and Goldstein that the schizophrenic deficit would become more prominent. This has been found to be the case in the Rodnick and Garmezy studies (1957). They report that a "minimal punishment" of a social type has a deleterious effect for the schizophrenics on a wide variety of tasks, (Dunn, 1954; Bleke, 1955). Heath (1956) reports schizophrenics show more response disorganization under anxiety conditions. Tomblen (1957) also finds that under anxiety schizophrenics show significantly greater deficit in conceptual performances.

Hypotheses

1. Schizophrenics and normals will be significantly differentiated in a verbal concept formation task. The poor premorbid schizophrenics will show (a) the lowest verbal concept (similarities) scores, (b) the fewest formal abstract responses and (c) the most split-narrow, fabulated, symbolic, and affective responses. The normals will show the best verbal concept scores, the most formal abstract responses and the fewest split-narrow, fabulated, symbolic, and affective responses.

The good premorbid schizophrenics will manifest verbal concept scores and the aforementioned language responses intermediate to the poor premorbid schizophrenics and normals. (Cameron, 1947; Hellman, 1961; Feldman and Drasgow, 1951; Baker, 1953; Leventhol, McGaughran and Moran, 1959; White, 1949)

2. As compared to the normal group, the poor premorbid schizophrenic subjects will manifest a significantly greater deficit in the verbal concept performance when exposed to mild verbal censure. This deficit will be shown by: (a) a decrement in verbal concept (similarities) scores, (b) fewer formal abstract responses, (Cameron, 1947; Sullivan, 1956; Rodnick and Garmezy, 1957; Dunn, 1954; Bleke, 1955; Heath, 1956), (c) more split-narrow, fabulated, symbolic and affective responses. The good premorbid schizophrenic subjects will be intermediate to the poor premorbid and normal subjects.

Method

Subjects: The subjects consisted of one group of 16 schizophrenic patients from the Northampton Veterans Administration Hospital who had made a good premorbid social adjustment. There was another group of 16 schizophrenics who had made a poor premorbid social adjustment. The third group was composed of 16 normal subjects. The normal subjects were selected at the Albany Veterans Administration Hospital and were being treated for general medical, non-psychiatric reasons. Care was taken to select only patients who apparently were not suffering from any severe or disabling emotional disturbances. The premorbid histories of the schizophrenic patients were judged on the basis of the Phillips Scale (Phillips, 1953). Two raters made independent judgments on 8 cases in each schizophrenic patient group in order to evaluate the reliability of the ratings. Many workers, including Phillips (1953), Rodnick and Garmezy (1957), Hellman and Kates (1961), Moriarty and Kates (1962) and Buck and Kates (1963) have reported adequate reliability in the use of the Phillips Scale. In this study the raters were in agreement on 15 of the 16 subjects as to placing them either in the good or poor premorbid groups. As the probability of getting such agreement by chance alone is $16 \times .5^{16}$, the extent of agreement is seen as highly significant.

The criteria used in the selection of the schizophrenic patients were as follows: (1) cooperative, white, males, (2) between the ages of 18 through 45, (3) not hallucinating, (4) no other complicating pathology, such as organicity, alcoholism, mental retardation, etc., and (5) no lobotomy or E.C.T. during the past year. The selection of

The normal subjects was based on the following criteria: (1) cooperative, white, males, (2) between the ages of 18 through 45, (3) no severe or disabling emotional disturbances such as a psychosis, neurosis, organic involvement, alcoholism, etc.

Matching: The three groups used in this study have been matched on the following variables: (1) Age: An analysis of variance shows no significant differences between the treatment groups. All the subjects are between 23 and 43 years of age (see Table 1). (2) Sex: All the subjects were males. (3) General Intelligence: Table 1 shows that all groups have been matched in terms of the Vocabulary sub-test of the Wechsler Adult Intelligence Scale (Wechsler, 1958). Analysis of variance again indicated no significant differences between the groups. The range of the vocabulary standard scores is from 7 to 15. The vocabulary sub-test is highly correlated with the Full Scale IQ on the Wechsler Adult Intelligence Scale. Wechsler (1958, p.85) reports the correlation between the Vocabulary sub-test and the Full Scale to be 0.82 for the age range 25 - 34. (4) Education: Analysis of variance indicates there are no significant differences between groups when they are compared on level of educational attainment (see Table 1). The range of educational attainment is 6th to 16th grade. (5) Socioeconomic Status: No significant differences were found between any of the groups in regard to socioeconomic status. The measure used to assess this was the subject's occupational class as indicated by the Minnesota Scale of Paternal Occupation (Goodenough and Anderson, 1931). The range of occupational class was 1 to 7 (see Table 1).

Table 1

Means Scores of Normals, Good Premorbid Schizophrenics, Poor Premorbid Schizophrenics, for Age, Vocabulary Test, Education, and Socioeconomic Status.

	Censure		No Censure	
Age	Mean	S.D.	Mean	S.D.
Normals	35.80[a].	4.13	34.00	3.98
Good Premorbid Schizophrenics	36.08	4.72	35.75	4.20
Poor Premorbid Schizophrenics	34.39	3.55	36.00	5.08
Vocabulary				
Normals	10.25[b].	2.00	10.50	2.15
Good Premorbid Schizophrenics	10.50	1.60	10.00	2.00
Poor Premorbid Schizophrenics	9.80	1.85	10.13	1.65
Education				
Normals	10.62[c].	1.77	10.85	1.29
Good Premorbid Schizophrenics	11.00	1.41	10.75	1.81
Poor Premorbid Schizophrenics	11.50	2.00	11.12	1.65
Socioeconomic Status				
Normals	4.87[d].	2.24	4.56	2.08
Good Premorbid Schizophrenics	4.78	1.78	4.32	1.94
Poor Premorbid Schizophrenics	4.56	1.40	4.38	1.56

a. Years of Age

b. Standard Score

c. Years of Education

d. A seven point scale of occupational class.

Verbal Concept Tasks

The test materials consisted of two equivalent forms of Similarities tests which were patterned upon the Wechsler-Bellevue scales by Webb (1955). The items in both tests had been arranged by Webb so that the sequence of presentation of difficulty was systematically staggered. Each consecutive group of four items was arranged in order of difficulty, from easy to hard, for example 1 - 4, 5 - 8, etc. The items of the tests are shown below:

Form I

1. Dog--Lion
2. Wagon--Bicycle
3. Beer--Wine
4. Mayor--Governor
5. Steam--Electricity
6. Street--Hall
7. Pound--Yard
8. Store--Bank
9. Ballgame--Movie
10. Thimble--Helmet
11. Air--Water
12. Ocean--Valley
13. Coat--Dress
14. Morning--Afternoon
15. Egg--Seed
16. Honesty--Bravery
17. Basket--Barrel
18. Salute--Handshake
19. Sawdust--Straw
20. Rock--Water

Form II

1. Orange--Banana
2. Oil--Gas
3. Ribbon--Lace
4. City--State
5. Cat--Mouse
6. Telephone--Letter
7. Factory--Farm
8. Poem--Statue
9. Iron--Silver
10. Doll--Ball
11. Fan--Mattress
12. Mountain--Lake
13. Canvas--Corduroy
14. Recipe--Pattern
15. Fur--Bark
16. Liberty--Justice
17. Piano--Violin
18. March--May
19. Sunburn--Mumps
20. Fly--Tree

Test Materials for No Censure Group:

The materials used for the control groups, the subjects who were not exposed to mild verbal censure, were the standard blocks used in the WAIS Block Design test. Only four of these red and white blocks were ever used to make simple block designs.

Procedure

Thirty-two schizophrenic subjects (including good premorbids and poor premorbids) and 16 normals were administered two similarities tests of 20 pairs of words each. All the tests were administered individually. One group of subjects (8 good premorbid schizophrenics, 8 poor premorbid schizophrenics, and 8 normals) had mild verbal censure intervene between the two similarities tests. The other group of subjects (8 good premorbid schizophrenics, 8 poor premorbid schizophrenics and 8 normals) had a neutral condition between the similarities tests. The design of the experiment is shown in Table 2.

Instructions: The method of giving the tests and the instructions to the subjects were as follows.

1. In all cases the subject was given an example of how the task was to be done before the first item of the first test was administered. He was told, "If I were to ask you in what way a table and a chair are alike, you could answer this by saying they are both furniture, or they are both made of wood, or they both have four legs. There are many such answers and I want you to give me the best one you can think of for each of the following items. Do you have any questions?"

2. After the example was given, one of the two alternate test forms of the Similarities tests was administered. No further help was provided in answering items after the example. The following plan was used to counterbalance the presentation of the two test forms: For any one experimental subgroup, 4Ss had Form I, mild verbal censure, Form II and the other 4Ss had Form II, mild verbal censure, Form I. For any

Table 2

Experimental Design

EXPERIMENTAL GROUP

Subjects	Phase One	Phase Two	Phase Three	Phase Four
8 Poor Premorbids	20 Similarity Items	Verbal Censure 2 Min. Delay	20 Similarity Items	Removal of Censure
8 Good Premorbids	20 Similarity Items	Verbal Censure 2 Min. Delay	20 Similarity Items	Removal of Censure
8 Non-Psychiatric Patients	20 Similarity Items	Verbal Censure 2 Min. Delay	20 Similarity Items	Removal of Censure

CONTROL GROUP

8 Poor Premorbids	20 Similarity Items	Block Task 2 Min. Delay	20 Similarity Items
8 Good Premorbids	20 Similarity Items	Block Task 2 Min. Delay	20 Similarity Items
8 Non-Psychiatric Patients	20 Similarity Items	Block Task 2 Min. Delay	20 Similarity Items

one control subgroup, 4Ss had Form I, block design task, Form II and the other 4Ss had Form II, block design task, Form I.

3. (a) Mild verbal censure condition: The subjects who had been preassigned to the experimental group were given mild verbal censure statements as described by Webb (1955). Each censure subject was told: "Off-hand, Mr.____ it 'looks like' you did worse that I would have expected of you. If you'll wait a few moments, I'll score your answers and we'll see". The examiner then pretended to score the responses to himself. Then, the subject was told, "Well, I've scored your answers, Mr. ____, and it turned out that you did worse than I thought at first. I have another test here. Let's see how you do on it."

(b) No-censure condition: For the no-censure condition, a block design task with four easy items was used. To build each design required using four blocks from the WAIS test (1955). The experimenter built each design first and the subject completed each design on his own. The four designs are given in the appendix. During the task no information was given to the subject about his performance. All subjects were able to complete the four items with little difficulty.

4. The censured subjects were reassured about their overall performance after all the experimental procedures had been completed.

Scoring Procedure: The poorest response was scored when two or more responses were given to any item. By following this procedure systematically, we believed that we would arrive at a valid evaluation of the thinking and language processes of both schizophrenic and normal subjects. In two investigations of language and thought processes in

schizophrenics, the frequent discrepancy between the initial responses given to verbal conceptual items and the processes underlying these initial responses has been noted. Rapaport et al (1945) have mentioned that the initial verbal responses, seemingly adequate, often mask pathological thought processes in schizophrenic patients. Further responses to a given verbal conceptual item frequently expose the underlying pathology. Hanfmann and Kasanin (1942) make the same analysis of the conceptual behavior of schizophrenic patients. For these investigators, frequently the ideas guiding apparently adequate conceptual groupings in schizophrenics are strikingly different from those of normal subjects with identical groupings. Wechsler (1958) indicates the necessity of further questioning to determine if the response is a true conceptualization or only verbal association. By taking into account any further associations given with these initial verbal conceptual responses, we may identify the underlying pathological processes. Often there was just one response to a test item, or the first response was the poorest one. The analyses of the scorings of the first given response are also reported in the Appendix.

The procedure used in scoring the records and responses was as follows: (1) A table of random numbers was consulted, and a different number assigned to each individual record. (2) All names or other possible identifying marks (besides the random number) were cut off from each record. (3) All the records were then thoroughly shuffled. (4) A large cardboard mask that would completely cover a record was

made (a small section the space required to answer one response was cut out of the center of the mask) and this was used in scoring all records, so that only one response could be seen at a time. (5) A clinical psychologist, besides the writer, also scored half (24) of the records for the various response categories. (6) A reliability coefficient was obtained for each of the following scoring categories:

(a) Verbal concept (similarities scoring) r=.93
(b) Formal abstract scoring, r=.87
(c) Idiosyncratic scoring, r=.91

Scoring Categories: The measures for scoring the responses were the usual Wechsler scoring procedure for the similarities test. The rating of the qualitative attributes of the verbalizations for the similarity of each item was adapted from a recent scoring procedure by Kates, Kates, and Michael (1960). Specifically, the response categories used in measuring concept attainment efficiency were:

1. Verbal Concept (Similarities) Scores: The scoring instructions of the WAIS Manual (1955) were followed in conjunction with the scoring criteria used by Webb (1955), (see Appendix IX, X). On individual items two points were given for, "Any general classification which is primarily pertinent for both members of the pair", (WAIS Manual, 1955). One point was given for, "Any specific properties common to both and which constitutes a relavant similarity". Zero points were given for, "Specific properties of each member of the pair, generalizations which are not pertinent, or differences," (For examples of these scorings see Appendix IX, X).

Besides being scored on the above basis, each individual response

was also scored for the type of verbalization used. The following categories were adapted from a scoring procedure for the Goldstein-Scheerer Object Sorting Test by Kates, Kates, and Michael (1960).

2. Formal Abstract (including Formal Primary) Responses: The defining criteria for formal types of verbalizations refer to the properties that bring about the classification of the two objects and which are inherent in the objects themselves. Although there are several types of formal categories, we shall deal with only so-called formal conjunctive categories. The authors state that, "A conjunctive category is defined by the joint presence of the appropriate value of one or several attributes" (Kates, Kates, and Michael, 1960). In this scoring the Formal Abstract and Formal Primary Verbalizations were scored as one grouping. Formal Abstract Verbalizations are defined as concepts that share a complex set of attributes. These concepts are very "open" in that many new things can be admitted, (e.g., "In what way are a dog and a lion alike?" Answer, "Both animals.") Formal Primary Verbalizations are defined as concepts that deal with qualities of shape, size, form, texture, smell, color, etc., (e.g., "In what way are a thimble and a helmet alike?" Answer, "Both are round.")

3. Idiosyncratic Verbalizations: The following response types have been combined to make up the idiosyncratic category:

A. Affective Verbalizations: These are responses in which the classification of the two objects is made because of a common emotional response, (e.g., "In what way are a wagon and a bicycle alike?" Answer, "I like

them both.")

B. Fabulated Responses: These are responses that start out with one attribute of one of the objects and make stories that also include the other object, (e.g., "In what way are a fly and a tree alike?" Answer, "A fly has wings so can fly into a tree."

C. Symbolic Verbalizations: These responses are defined as those in which the meanings of the objects are changed and the items are classified according to new symbolic meanings, (e.g., "In what way are beer and wine alike?" Answer, "Both stand for evil.")

D. Split-Narrow Verbalizations: These responses are defined as dividing the two objects and placing each object under a separate concept, (e.g., "In what way are an orange and a banana alike?" Answer, "Oranges are round and bananas are yellow.")

Results

A split plot analysis of variance technique was utilized to assess the differences between the groups (normals, good premorbid schizophrenics, and poor premorbid schizophrenics), and the interaction (groups by censure by halves), for the three dependent variables of verbal concept (similarities) scores, formal abstract scores, and idiosyncratic scores, (Lindquist, 1956, p.281).

Tests for homogeneity of variance showed significant heterogeneity between groups for verbal concept (similarities) scores and idiosyncratic scores (Table 3). Further, significant heterogeneity of variance was found for the interaction (groups by censure by halves) for idiosyncratic scores (Table 4). Also, the distributions of scores for the idiosyncratic variable tended to be slightly skewed approximating J-shaped functions. An allowance was made for the above factors of heterogeneity of form and of variance by setting a higher "apparent" level of significance for the tests of treatment effects as suggested by Norton (Lindquist 1956, pp.78-88). In this study the .025 level of significance will be used when the assumptions underlying the F test are not met. Otherwise, the .05 significance level will be utilized.

The first hypothesis, part (a) was supported by the results. There was a significant difference between groups (Normals, good premorbids, and poor premorbids), in the predicted directions, on verbal concept (similarities) scores at the .008 level. This significance level is well beyond the .025 level (Table 5). Duncan Range tests indicated that on verbal concept (similarities) scores, the normal group

Table 3

Tests of Homogeneity of Variance between Normals, Good Premorbid Schizophrenics and Poor Premorbid Schizophrenics for Dependent Variables

	Variables		
	V.C.	F.A.	Id.
Variances of[a]. Normals	13.03	9.61	1.56
Variance of Good[a]. Premorbids	26.94	11.56	6.20
Variance of Poor[a]. Premorbids	47.61	18.40	11.15
Max. Ratio F[b].	3.65*	1.91	7.15*

Code

a. Based on raw data.

b. The critical region for F based on 3 groups and 31 d.f. is 2.40 at the 95th percentile. The procedure was that of Hartley as described in Walker and Lev (1953, p.192).

* Significant heterogeneity.

V.C. Verbal Concept (Similarities) Scores

F.A. Formal Abstract Scores

Id. Idiosyncratic Scores

Table 4

Tests of Homogeneity of Variance of Groups X Censure X Halves Interaction for Dependent Variables

	VARIABLES					
	V.C.		F.A.		Id.	
	1st half,	2nd half	1st half,	2nd half	1st half,	2nd half
Variences of Normals[a].						
Censure	11.36,	17.14	15.68,	13.40	2.28,	1.72
No Censure	14.67,	13.18	6.97,	7.13	1.99,	.57
Variances of Good[a]. Premorbids						
Censure	17.14,	30.69	9.55,	16.56	4.20,	3.69
No Censure	44.69,	26.94	13.18,	10.11	8.41,	5.38
Variances of Poor[a]. Premorbids						
Censure	52.71,	42.51	25.00,	16.08	11.15,	6.00
No Censure	33.76,	56.25	11.42,	21.81	15.84,	5.29
Max. Ratio F[b].	4.95		3.59		27.79*	

CODE:

a. Based on raw data

b. The critical region for F based on 12 groups and 7 d.f. is 15.8 at the 95th percentile

* Significant heterogeneity

V.C. Verbal Concept (Similarities) Scores

F.A. Formal Abstract Scores

Id. Idiosyncratic Scores

Table 5

Analysis of Variance for Verbal Concept (Similarities) Scores

Source	d.f.	S.S.	M.S.	F Ratio	P Value
Total	95	3314.49			
Between	47	2751.99			
G	2	586.08	293.04	5.70	.008
C	1	2.34	2.34	.045	----
G X C	2	4.75	2.38	.046	----
Between Error	42	2158.82	51.40		
Within	48	562.50			
H	1	58.59	58.59	6.72	.015
G X H	2	33.25	16.63	1.90	----
C X H	1	52.51	52.51	6.03	.020
G X C X H	2	52.33	26.17	3.00	.065
Within Error	42	365.82	8.71		

CODE

G - Groups (Normals, Good Premorbids and Poor Premorbids)

C - Mild Verbal Censure (censure or no censure)

H - Halves (First or Second)

was found to be significantly different (at the .05 level) from both the poor premorbid and good premorbid schizophrenic groups (Table 6). The good premorbids were, however, not significantly differentiated from the poor premorbid schizophrenics. In terms of Part A of the first hypothesis, it was predicted that the schizophrenics would be significantly different from the normals. In addition, the normals would do the best, the "poors" the worst and the "goods" would be intermediate to these two groups. These results confirm Part A of the first hypothesis.

Part (b) of the first hypothesis was not supported by the results although there was a trend. No significant difference between groups was found for formal abstract scores (Table 7). However, there was a tendency (at the .10 level) with the normals offering more formal abstract responses than did the schizophrenics. This tendency was in agreement with the hypothesis.

Part (c) of the first hypothesis was confirmed. The normals gave fewer idiosyncratic responses than schizophrenics and this finding was significant at the $<.001$ level (Table 8). Duncan Range Tests for the three groups on the idiosyncratic verbalizations showed the following. The poor premorbid schizophrenics gave the greatest number of idiosyncratic responses and were significantly different from both good premorbid schizophrenics and normals (Table 6). Good premorbids gave the next highest number of idiosyncratic responses and were significantly different from both poor premorbids and normals. The normal subjects gave the smallest number of idiosyncratic responses and were significantly

Table 6

Duncan Range Comparisons after Analyses of Variance for Main Effect of Groups (Normals, Good Premorbids and Poor Premorbids)[a].

Verbal Concept (Similarities) Scores

	Normals	Good Premorbids	Poor Premorbids
Means	24.97	21.28	18.97[b].

Idiosyncratic Scores

Means	2.06	3.78	5.44[b].

CODE

a. Duncan's New Multiple Range Test applied to the differences between means, K = 3. (From Edwards, 1960, pp.136 - 140, p.373.)

b. Treatment means not underlined are significantly different. Treatment means underlined by same line are not significantly different. The .05 level of significance was utilized.

Table 7

Analysis of Variance for Formal Abstract Scores

Source	d.f.	S.S.	M.S.	F Ratio	P Value
Total	95	1347.96			
Between	47	1173.96			
G	2	119.15	59.57	2.41	.10
C	1	2.67	2.67	.11	____
G X C	2	13.40	6.70	.27	____
Between Error	42	1038.74	24.73		
Within	48	174.00			
H	1	5.04	5.04	1.62	____
G X H	2	10.15	5.07	1.63	____
C X H	1	6.00	6.00	1.92	____
G X C X H	2	21.81	10.91	3.50	.045
Within Error	42	131.00	3.12		

CODE G - Groups (Normals, Good Premorbids and Poor Premorbids)

C - Mild Verbal Censure (censure or no censure)

H - Halves (First or Second)

Table 8

Analysis of Variance for Idiosyncratic Scores

Source	d.f.	S.S.	M.S.	F Ratio	P Value
Total	95	767.49			
Between	47	596.99			
G	2	182.27	91.14	10.64	<.001
C	1	41.34	41.34	4.83	.04
G X C	2	13.56	6.78	.79	____
Between Error	42	359.82	8.65		
Within	48	170.50			
H	1	..26	.26	.10	____
G X H	2	7.77	3.89	1.55	----
C X H	1	38.76	38.76	15.42	.001
G X C X H	2	18.15	9.07	3.61	.04
Within Error	42	105.56	2.51		

CODE

G - Groups (Normals, Good Premorbids and Poor Premorbids)

C - Mild Verbal Censure (censure or no censure)

H - Halves (First or Second)

different from both the good premorbid and poor premorbid schizophrenics. The means and standard deviations for the normals, good premorbid schizophrenics, and the poor premorbid schizophrenics on verbal concepts, formal-abstract verbalizations, and idiosyncratic verbalizations are given on Table 9.

The second hypothesis, part (a), was not supported by the results. The schizophrenics as compared to the normal group did not show a significantly greater decrement in verbal concept (similarities) scores when exposed to mild verbal censure. However, there was a strong tendency (at the .065 level) in agreement with the hypothesis (Table 5).

On the other hand, part (b) of the second hypothesis was confirmed. The schizophrenics when compared to normals did show a significant decrement (at the .045 level) of formal abstract responses when exposed to mild verbal censure (Table 7). Duncan's multiple range test was used to evaluate the basis for this significant interaction (Table 11). Apparently, the reason for this significant finding was the difference in reaction to verbal censure on the part of the poor premorbids, good premorbids, and normals. The poor premorbids increased significantly and greatly on formal abstract concepts in the no-censure condition, from 8.00 to 11.13. They showed a relatively moderate decrease under censure, from 9.25 on first half to 8.87 on second half. On formal abstract concepts, the goods increased slightly under no-censure, from 10.50 to 10.88 on the first and second halves respectively. Under censure, the goods decreased slightly on formal abstract concepts. The normals showed a reversal of the effects produced by censure and

Table 9

Means and Standard Deviations of Normals, Good Premorbids and Poor Premorbids for Dependent Variables

(for each group, N = 16)

		V.C.	F.A.	Id.
Normals	Mean	24.97	14.94	2.06
	S.D.	3.61	3.10	1.25
Good Premorbids Schizophrenics	Mean	21.28	11.34	3.78
	S.D.	5.19	3.40	2.49
Poor Premorbid Schizophrenics	Mean	18.97	9.31	5.44
	S.D.	6.90	4.29	3.34

CODE

V.C. Verbal Concept (Similarities) Scores

F.A. Formal Abstract Scores

Id. Idiosyncratic Scores

Table 10

Means and Standard Deviations of Normals, Good Premorbids and Poor Premorbids under Mild Verbal Censure and without Verbal Censure for Dependent Variables (for each group, N = 8)

	V.C.		F.A.		Id.	
	1st half	2nd half	1st half	2nd half	1st half	2nd half
Censure Mean	24.75	25.50	11.75	12.25	2.38	2.00
S.D.	3.37	4.14	3.96	3.66	1.51	1.31
Normals						
No Censure Mean	24.13	25.50	12.13	11.50	2.38	1.50
S.D.	3.83	3.63	2.64	2.67	1.41	.76
Censure Mean	21.00	20.88	12.13	11.88	3.76	5.63
S.D.	4.14	5.54	3.09	4.06	2.05	1.92
Good Premorbids						
No Censure Mean	21.13	22.13	10.50	10.88	3.13	2.63
S.D.	6.64	5.19	3.63	3.18	2.90	2.33
Censure Mean	18.88	18.50	9.25	8.87	5.38	7.38
S.D.	7.26	6.52	5.01	4.02	3.34	2.45
Poor Premorbids						
No Censure Mean	15.88	22.63	8.00	11.13	5.88	3.13
S.D.	5.82	7.50	3.38	4.67	3.98	2.30

CODE:

V.C. Verbal Concept (Similarities) Scores

F.A. Formal Abstract Scores

Id. Idiosyncratic Scores

Table 11

Duncan Range Comparisons after Analysis of Variance for the Interaction of Groups X Mild Verbal Censure X Halves[a]

	$G_1C_1H_2$	$G_1C_2H_1$	$G_2C_1H_1$	$G_2C_1H_2$	$G_1C_1H_1$	$G_1C_2H_2$	$G_3C_2H_2$	$G_2C_2H_2$	$G_2C_2H_1$	$G_3C_1H_1$	$G_3C_1H_2$	$G_3C_2H_1$
Means[b]	12.25	12.13	12.13	11.88	11.75	11.50	11.13	10.88	10.50	9.25	8.87	8.00

CODE

G_1 Normals

G_2 Good Premorbid Schizophrenics

G_3 Poor Premorbid Schizophrenics

C_1 Mild Verbal Censure

C_2 "Neutral"

H_1 Test 1

H_2 Test 2

a. Duncan's New Multiple Range Test applied to the differences between means, K = 12. (from Edwards, 1960, p.136 - 140, p.373.)

b. Treatment means not underlined are significantly different. Treatment means underlined are not significantly different. The .05 level of significance was utilized.

no-censure in the schizophrenic groups. The normals decreased moderately under no-censure (from 12.13 to 11.50) and increased moderately under censure (11.75 to 12.25)

Part (c) of the second hypothesis was not supported. There was a finding at the .04 level of significance showing that schizophrenics increased in idiosyncratic responses when censured, in contrast to the normals. However, due to the heterogeneity of variance, a higher level of significance, the .025 level, was pre-established. The significance level of this finding was just short of the pre-established level. The pattern of changes from one half to the other for each group on verbal concept and idiosyncratic scores was inspected. Both showed near significant results in the groups by censure by half interaction. In both instances, the patterns are in high agreement with the formal abstract scores pattern. On the verbal concept (similarities) scores, the greatest change was again shown by the poor premorbid schizophrenic group under the no-censure condition. They improved on verbal concept scores in the transition from the first half to the second half. The poor premorbid schizophrenics who received mild verbal censure showed a slight decrease in verbal concept scores. On idiosyncratic scores, the pattern of changes is also similar to the pattern of changes for the formal abstract scores. The means and standard deviations for normals, good premorbid schizophrenics, poor premorbid schizophrenics under mild verbal censure and without censure are given in Table 10.

Discussion

Verbal Concept Performance. The first hypothesis, part (a), was supported by the results and indicates that schizophrenic subjects are not as competent upon the verbal similarities test as the normal subjects. It will be recalled that the schizophrenic subjects have been matched with the normal subjects upon education and current knowledge of vocabulary. Despite this matching on some of the factors necessary to equivalent performance, there was this significant discrepancy in verbal similarities performance of the schizophrenic subjects. As indicated by Rapaport et al (1945) and by Wechsler (1958, p.182), the similarities test is often viewed as one of abstraction or verbal concept formation. One warranted conclusion seems to be that schizophrenics are not as capable in verbal abstraction or verbal concept formation as normals.

The nature of the processes involved in verbal concept formation may provide some understanding of the differences between schizophrenics and normals. The similarities test involves the ability to perceive shared elements that the referents of the two words possess. In addition, the ability to bring the referents of these words under a single concept is tapped. It might be added that the recognition of essential qualities rather than trivial ones that are shared is also necessary. On these aspects of the verbal concept formation process, there seems to be a significant impairment manifested by schizophrenic subjects.

A Duncan range test showed there was a (non-significant) tendency for good premorbids to perform more efficiently than poor premorbids in their verbal concept (similarities) performances. The prediction was

that the poor premorbids would show a greater inadequacy in verbal conceptualization than the good premorbids. There was a tendency in the correct direction seen in the results. Possibly, the greater pre-psychotic adequacy (as measured by the Phillips scale) of the good premorbid schizophrenics is associated with better verbal performance on this task. This raises the question of the overall relationship between ability to make abstractions and the ability to adapt. It seems clear that the ability to group and categorize as equivalent seemingly dissimilar events is a necessary condition to adequate adjustment. Where there is a severe deficiency in the ability to group and categorize objects and events, adjustment to the many situations of life will be inadequate.

Formal Abstract Performance. The second part of the first hypothesis, part (b), was not supported by the results; there was no significant difference between the three groups on formal abstract responses to the similarities items. However, there was a trend at the .10 level in conformity with the prediction. An inspection of the mean scores also reveals a predicted rank ordering of normals, good premorbids and poor premorbids. Normals showed the most formal abstract responses and the poor premorbids manifested the smallest number of formal abstract responses. The formal abstract response refers to the specification of some group of properties inherent in the referents of the words. These groupings are open to other events or objects possessing the same shared combination of attributes. There is a trend for the three groups to show differences in their ability to find similarities for words whose

referents possess the same general inherent properties. But since the results are noted at the .10 level only, inferences about the poorer formal abstract ability of schizophrenics should be viewed with caution.

Idiosyncratic Performance. Part (c) of the first hypothesis was supported by the results; the three groups were significantly different on idiosyncratic responses to the items. In addition, the poor premorbid schizophrenics gave significantly more idiosyncratic responses than the good premorbids who, in turn, gave significantly more idiosyncratic responses than the normals. The idiosyncratic responses include (a) the affective verbalization, a response to an item involving a description of an emotional reaction, (b) the fabulated verbalization, a story linking the two words, (c) the symbolic verbalization, a reinterpretation of the words and their classification upon the basis of this reinterpretation and (d) the split-narrow verbalization, the inability to group together the words of the item on the basis of some shared combination of qualities. The above criteria of the idiosyncratic response point to characteristic attributes of schizophrenic verbalizations. These include the inability to abstract shared qualities upon the basis of which objects can be grouped and the intrusion of personal and irrelevant standards for grouping items.

On the basis of these results, the inference can be drawn that schizophrenic verbalization is associated with premorbid adjustment. The greater the prepsychotic inadequacy of the patients the greater the frequency of the schizophrenic indicators in their verbal responses. The normals have the smallest number, good premorbids have an intermediate

number, and the poor premorbids have the greatest number. Again, the question of the overall association of adjustment adequacy with verbalization adequacy needs to be evaluated. Where irrelevant personal matters intrude into social contexts, then the adjustment of the individual manifesting these personal intrusions will be greatly impaired. In addition, the life situations that demand grouping on the basis of some shared characteristics will be most likely ineptly met. And where these characteristics are displayed in every day adjustments, then prepsychotic inadequacy is to be expected. The prepsychotic inadequacy will be greater, the more frequently these aspects are displayed. But, the factor of inadequacy in every day adjustment upsetting valid verbalization abilities must not be overlooked. There is the possibility that the vulnerability to anxiety may be so great in certain individuals that interpersonal contacts result in a breakdown of logical and coherent verbalizations.

Verbal Concept Performance. The second hypothesis, part (a), was not supported by the results; the effect of censure upon verbal conceptual scores was not significantly different for the three groups. However, there was a trend at the .065 level. When the scores of the three groups are considered, it is obvious that the poor premorbids, in relation to a poor premorbid control group, suffered the greatest decrease as a consequence of the censure and the normals the smallest decrease in verbal concept scores. This trend conforms to the theoretical statements and the empirical findings of the research program of Rodnick and Garmezy (1957) and to the findings of Webb (1955).

The poor premorbid schizophrenic is very responsive to threat of failure and his performance on the verbal task seemed to suffer. A cautious inference is that the tenuous adjustment of the poor premorbid schizophrenic can be upset by mild censure introducing threat of further failure.

As censure was given only once, there is a possibility that if this verbal censure had been made stronger in tone, or had been given more than once, the trend we observed may have become more striking and significant. In relation to this, it will be recalled that Rapaport (1945) noted the strongly ingrained aspects of the associations to some of the similarities pairs that have been used here. It is then a possibility that the censure may have not been strong enough to disrupt stereotyped associations requiring little active concept formation.

Formal Abstract Performance. The second hypothesis, part (b), was supported by the results; censure had significant differential effects upon the formal abstract performance of the three groups. The poor premorbids showed the greatest loss on the censure condition second half relative to the no-censure condition second half of all the three groups. The good premorbids showed the next highest loss on the censure condition second half relative to the no-censure condition second half. Normals did not show any detrimental effects as a consequence of censure. As a matter of fact, the normals improved on formal abstract responses to a slight extent following censure. Again the extreme susceptibility to the threat of failure is evident in the poor premorbids. It is note-

worthy that this threat of failure affected the formal abstract response. This response, it is recalled, involves the grouping of words upon the basis of their referents sharing inherently certain general and open characteristics. Formal abstract responses demand the capacity to react to stimuli in a differentiated way and to select and generalize their cues. When threat of failure is anticipated, the tendency is to give up the attempt to relate the perceived data to certain inclusive categories and to use less formal criteria for classifying words.

Idiosyncratic Performance. The second hypothesis, part (c), was not supported by the results; censure did not show differential effects for the variable of idiosyncratic responses among the three groups. There was a significant finding at the .04 level, but the fact of heterogeneity of variance led to the setting of the .025 level. Hence, this finding just failed to reach significance. However, there is a trend which is in the same direction as the prediction made by this part of the second hypothesis. Once more, we note the greater sensitivity to threat of failure on the part of the poor premorbids. They showed the greatest increase in the number of idiosyncratic responses following censure relative to their performance under no-censure. In addition, the good premorbids made the next greatest increase in the number of idiosyncratic responses following censure relative to their performance under no-censure. The normals decreased in the number of idiosyncratic responses following both censure and no-censure.

Furthermore, the idiosyncratic response has the characteristics

indicative of schizophrenic verbalizations. There is the intrusion of irrelevant and personal considerations. Another is the inability to offer a shared characteristic or a number of shared characteristics that cause words to belong together. The fact that a threat of failure leads to a tendency to employ more idiosyncratic verbalizations offers support to those theories relating schizophrenic language to increased interpersonal threat. The evidence though not conclusive suggests that increased threat affects verbalizations and results in disorganization. If this is confirmed by more definitive research findings, then we may have greater understanding of the disorganizing effects of threat upon verbalizations.

When the patterns of change from one half to the other (test one to test two) were inspected, for each group across all three measures (verbal concept similarities, formal abstract scores and idiosyncratic scores), a high degree of consistency was found. In all cases the greatest improvement in efficiency of performance on the second half was shown by the poor premorbid schizophrenics under the no-censure condition. In relation to this group the poor premorbid schizophrenics who received mild verbal censure showed the least efficient performance in the transition from one half to the other.

The above findings are in agreement with the theoretical statements and empirical findings of Rodnick and Garmezy (1957) and Webb (1955). They have hypothesized that a schizophrenic is able to respond adaptively to tasks of great complexity provided he is motivated to insure his cooperation. If, however, a small amount of censure is

introduced his tenuous adaptibility will be revealed. The findings of the present study support the view that censure is important in influencing the schizophrenics characteristic deficit.

Important also is the interesting finding indicating that the poor premorbid schizophrenics showed a change toward a more efficient performance. This improvement, e.g., formal abstract scores, brought their second half performance to a level that was close to and not significantly different from the normals performance. Other writers besides Rodnick and Garmezy have noted the schzophrenic's variable ability to respond adaptively to complex tasks. Wegrocki (1940) noted that schizophrenics under non-stressful surroundings, with good rapport present, were able to perform on an abstract concept task effectively in a way that had at first seemed impossible. Cameron (1944) also has noted that schizophrenics are able to perform in a more "normal" manner. The above findings show that the schizophrenic is able at times to perform at a much higher level than would be expected. The importance of a further and more refined investigation of the factors behind the schizophrenics variable performances appears desirable.

Summary

The purpose of this study was to investigate verbal concept attainment of good premorbid schizophrenics, poor premorbid schizophrencis, and normals when the experimental condition of mild verbal censure was introduced. The verbal concept task was an elaboration of the Wechsler Similarities sub-test.

Thirty-two schizophrenics (16 good premorbids and 16 poorpremorbids) were selected from Veterans Administration Hospital populations and matched with normals on age, sex, general intelligence, education and socioeconomic status. Half of these Ss were given similarities tests with mild verbal censure and half with no mild verbal censure.

From the theories of Cameron, Sullivan, and Goldstein, it was expected that schizophrenics when compared to normals would show a greater deficit in verbal similarities performance. More specifically, this deficit was expected to be shown in verbal concept (similarities) scores, formal abstract scores and by language that is indicative of primary process thinking (idiosyncratic scores). It was also expected that the greater the prepsychotic social inadequacy of the schizophrenics, as operationally measured by the Phillips Scale, the greater the deficit in verbal similarities performance. When mild verbal censure is introduced, following from the above theories it was expected that the schizophrenic deficit would become more prominent.

The results indicated that schizophrenics are not as competent upon verbal concept (similarities) performances as normals. A conclusion seems to be that schizophrenics generally do not perform as

adequately as normals on verbal concept formation tasks.

The findings showed no significant differences between normals and schizophrenics on formal abstract scores. There was, however, a tendency in the expected direction. As this was only a tendency any conclusions about poorer abstract ability of schizophrenics must be viewed with caution.

The results showed that schizophrenics gave significatnly more idiosyncratic responses than normals. Also, the poor premorbid schizophrenics gave significantly more idiosyncratic responses than good premorbid schizophrenics who, in turn gave more idiosyncratic responses than normals. Several conclusions were drawn. Schizophrenics' verbal performances show a higher susceptibility to being invaded by irrelevant and personal material and this may have an effect upon current social adjustment. Further, the prepsychotic social adjustment levels, as measured by the Phillips Scale, were reflected in the differences on the idiosyncratic measure between poor and good premorbid schizophrenics. Differences were not found for verbal concept (similarities) scores or formal abstract scores between poor and good premorbids. But in all cases there was a rank ordering with normals performing at the most efficient level, than good premorbids, and poor premorbids performing least efficiently.

With mild verbal censure the schizophrenics in relation to a control group showed a deficit on formal abstract performance compared to normals who showed no deficit. In contrast, schizophrenics who received no mild verbal censure showed an increase in the efficiency of

their performance. These effects were most pronounced for the poor premorbid schizophrenic group. On the verbal concept (similarities) and idiosyncratic scores similar strong, but non-significant, tendencies were seen. One inference seems to be that the tenuous adjustment of the poor premorbid schizophrenic can be upset by mild censure introducing threat of further failure.

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Appendix I.

Tests of Homogeneity of Variance between Normals, Good Premorbid Schizophrenics and Poor Premorbid Schizophrenics for Dependent Variables

(Based on first responses)

	Variables		
	V.C.	F.A.	Id.
Variances of Normals[a.]	12.25	10.24	2.19
Variances of Good Premorbids[a.]	27.46	12.25	2.92
Variances of Poor Premorbids[a.]	44.89	19.36	4.33
Max. Ratio F[b.]	3.66*	1.89	1.98

CODE

a. Based on raw data

b. The critical region for F based on 3 groups and 31 d.f. is 2.40 at the 95th percentile. The procedure was that of Hartley as described in Walker and Lev (1953, p.192).

* Significant heterogeneity.

V.C. Verbal Concept (Similarities) Scores

F.A. Formal Abstract Scores

Id. Idiosyncratic Scores

Appendix II.

Tests of Homogeneity of Variance of the Groups X Censure X Halves Interaction for Dependent Variables (Based on first responses)

	VARIABLES					
	V.C.		F.A.		Id.	
	1st half,	2nd half	1st half,	2nd half	1st half,	2nd half
Variance of Normals[a].						
Censure	10.82,	7.45	10.89,	10.43	3.35,	1.44
No Censure	19.09,	15.44	8.58,	13.25	1.64,	1.85
Variance of Good[a]. Premorbids						
Censure	18.23,	39.44	10.50,	19.36	4.84,	3.92
No Censure	38.44,	25.40	13.99,	9.42	5.29,	6.55
Variance of Poor[a]. Premorbids						
Censure	54.76,	35.88	24.90,	13.69	8.00,	6.40
No Censure	42.12,	59.90	24.30,	22.75	16.00,	13.69
Max. Ratio F^{6}.	8.04				11.11	

CODE

a. Based on raw data

b. The critical region for F based on 12 groups and 7 d.f. is 15.8 at the 95th percentile

* Significant heterogeneity

V.C. Verbal Concept (Similarities) Scores

F.A. Formal Abstract Scores

Id. Idiosyncratic Scores

Appendix III.

Analysis of Variance for Verbal Concept (Similarities) Scores

(Based on first responses).

Source	d.f.	S.S.	M.S.	F Ratio	P Value
Total	95	3070.63			
Between	47	2640.63			
G	2	439.19	219.59	4.20	.025
C	1	2.04	2.04	.039	----
G X C	2	1.52	.76	.014	----
Between Error	42	2197.88	52.33		
Within	48	430.00			
H	1	30.38	30.38	3.44	.08
G X H	2	10.56	5.28	.60	----
C X H	1	2.04	2.04	.23	----
G X C X H	2	16.15	8.07	.914	----
Within Error	42	370.87	8.83		

CODE

G - Group (Normals, Good Premorbids and Poor Premorbids)

C - Mild Verbal Censure (censure or no censure)

H - Halves (First or Second)

Appendix IV.

Analysis of Variance for Formal Abstract Scores

(Based on first responses)

Source	d.f.	S.S.	M.S.	F Ratio	P Value
Total	95	1361.33			
Between	47	1211.33			
G	2	64.15	32.07	1.18	----
C	1	2.67	2.67	.098	----
G X C	2	1.65	.82	.030	----
Between Error	42	1142.86	27.21		
Within	48	150.00			
H	1	24.00	24.00	8.72	.005
G X H	2	3.06	1.53	.56	----
C X H	1	1.50	1.50	.54	----
G X C X H	2	5.81	2.91	1.06	----
Within Error	42	115.63	2.75		

CODE

G - Group (Normals, Good Premorbids and Poor Premorbids)

C - Mild Verbal Censure (censure or no censure)

H - Halves (First or Second)

Appendix V.

Analysis of Variance for Idiosyncratic Scores

(Based on first responses)

Source	d.f.	S.S.	M.S.	F Ratio	P Value
Total	95	632.96			
Between	47	503.96			
G	2	84.15	42.07	4.41	.02
C	1	7.04	7.04	.74	---
G X C	2	11.65	5.82	.61	---
Between Error	42	401.12	9.55		
Within	48	129.00			
H	1	2.04	2.04	.78	---
G X H	2	14.77	7.39	2.82	.08
C X H	1	2.04	2.04	.78	---
G X C X H	2	.27	.14	.05	---
Within Error	42	109.88	2.61		

CODE

G - Group (Normals, Good Premorbids, and Poor Premorbids)

C - Mild Verbal Censure (censure or no censure)

H - Halves (Firs or Second)

Appendix VI.

Means and Standard Deviations of Normals, Good Premorbids and Poor Premorbids for Dependent Variables

(Based on first responses)

(for each group, N = 16)

		V.C.	F.A.	Id.
Normals	Mean	25.62	12.28	2.03
	S.D.	3.50	3.20	1.48
Good Premorbids	Mean	21.53	10.88	2.97
	S.D.	5.24	3.50	1.71
Poor Premorbids	Mean	20.60	10.34	4.31
	S.D.	6.70	4.40	2.08

CODE

V.C. - Verbal Concept (Similarities) Scores

F.A. - Formal Abstract Scores

Id. - Idiosyncratic Scores

Appendix VII.

Means and Standard Deviations of Normals, Good Premorbids and Poor Premorbids under Mild Verbal Censure and without Verbal Censure for Dependent Variables (for each group, N = 8)

(Based on first responses)

	V.C.		F.A.		Id.	
	1st half	2nd half	1st half	2nd half	1st half	2nd half
Normals						
Censure Mean	24.75	26.00	11.00	12.88	2.75	2.00
S.D.	3.28	2.73	3.30	3.23	1.83	1.20
No Censure Mean	25.37	26.37	12.38	12.88	2.25	1.13
S.D.	4.37	3.92	2.93	3.64	1.28	1.36
Good Premorbids						
Censure Mean	21.25	22.00	10.25	11.25	3.00	4.25
S.D.	4.27	6.28	3.24	4.40	2.20	1.98
No Censure Mean	22.13	22.00	11.00	11.00	2.13	2.50
S.D.	6.20	5.04	3.74	3.07	2.29	2.56
Poor Premorbids						
Censure Mean	20.38	20.88	9.88	10.75	4.38	3.88
S.D.	7.41	5.99	4.99	3.70	2.83	2.53
No Censure Mean	18.88	22.25	9.50	11.25	5.00	4.00
S.D.	6.49	7.74	4.93	4.77	4.00	3.70

CODE

V.C. - Verbal Concept (Similarities) Scores

F.A. - Formal Abstract Scores

Id. - Idiosyncratic Scores

Appendix VIII.

Raw Data of Normals, Good and Poor Premorbid Schizophrenics*

	Variables					
	Verbal Concept Scores		Formal Abstract Scores		Idiosyncratic Scores	
	1st half,	2nd half	1st half,	2nd half	1st half,	2nd half
	25	27	7	9	3	2
	26	23	16	14	1	4
	23	21	9	7	4	2
Censure	27	23	14	14	1	1
	18	23	6	8	5	1
	23	24	12	14	2	3
	28	33	14	16	1	0
Normals	20	30	16	16	2	3
	24	26	13	15	2	2
	21	26	9	12	4	1
	18	22	9	11	2	2
No Censure	24	29	12	12	4	2
	27	24	14	11	3	2
	31	32	17	14	0	0
	24	24	11	11	1	2
	24	21	24	21	3	1
	15	17	15	17	5	6
	24	19	14	9	4	7
	20	23	11	11	5	6
Censure	25	20	14	12	3	6
	16	12	6	4	7	9
	19	21	10	13	0	3
	23	24	12	13	3	4
Good	26	31	15	16	3	4
Premorbids	20	25	12	11	3	3
	20	20	8	10	1	1
	29	31	17	17	1	0
No Censure	18	20	10	9	4	7
	10	17	5	7	9	4
	17	16	8	8	5	3
	25	22	12	12	2	3
	30	27	12	13	0	0
	20	24	11	12	4	4
	10	7	1	1	9	11
	27	24	15	12	3	7
Censure	28	25	14	12	3	5
	20	21	10	11	4	6
	23	15	12	8	3	9
	14	20	8	10	5	7
Poor	9	12	3	5	12	10
Premorbids	25	31	12	16	3	1
	18	22	9	10	2	1
	21	29	13	16	2	1
No Censure	19	27	8	13	6	3
	14	11	8	6	8	7
	8	13	3	3	7	6
	11	20	5	11	5	3
	11	28	6	14	14	3

*Data for analyses reported in Tables 3 - 11.

Appendix IX.

Scoring Criteria for Similarities

Test Form I

	Item	2 points	1 point	0 points
1.	Dog-Lion	Animals,mammals	Have legs,fur eyes,tails,etc., belong to same species.	Look alike, lion growls, and dog barks,dangerous.
2.	Wagon-Bicycle	Vehicles,conveyances,means of transportation.	Toys,ride on, have wheels,both roll,children play with them.	Made of steel.
3.	Beer-Wine	Liquors,intoxicants,alcoholic drinks.	Contain alcohol, beverages,drink both,make you drunk,liquids.	Both stand for evil.
4.	Mayor-Governor	Heads of gov't., executive officers,public officials,high positions in gov't.	Have something to do with law, officials,administrate,have power,rulers,run things,politicians,leaders.	Forms of gov't., both men,part of gov't.,
5.	Steam-Electricity	Sources of power,energy,power, produce power.	Do work,heat things,burn you, utilities.	Forces of science,serve mankind.
6.	Street-Hall	Passageways, walkways.	Walk there,for traffic,long, straight.	Go in a certain direction.
7.	Pound-Yard	Units of measurement,measurement of quantity, measurement.	Tell how big, tell how much, measure something.	Both for exercise, both playgrounds, places of confinement.
8.	Store-Bank	Places of business,places of exchange.	Handle money, service to the public,public buildings,do business,people work there.	Buildings,have what you need.

Appendix IX.

Test Form I (continued)

	Item	2 points	1 point	0 points
9.	Ballgame-Movie	Entertainment, recreation, amusement.	People go there, fun, relaxation.	Like them both, activity.
10.	Thimble-Helmet	Protective devices, for protection.	Metal, steel, wear them, cover part of the body, shaped alike--- hollow.	Containers, objects, use for work.
11.	Air-Water	Necessary for life, can't live without them.	Elements, have oxygen, help us in living, you need both, means of transportation, used for cleaning purposes.	Everywhere on earth, nature's products, nature's gifts, keeps on going, in clouds.
12.	Ocean-Valley	Parts of terrain, geographical features, natural features.	Scenery, deep, nature made, surrounded by higher land, resorts there, low areas.	Form of landmaks, both places, on a map, both have deep crevices.
13.	Coat-Dress	Garments, wearing apparel, clothing.	Wear both, cover the body, keep you warm, made of cloth, put on, to wear.	Coat is warmer, made of same material, you put coat on top of dress.
14.	Morning-Afternoon	Parts of a day, time of day, times.	Daytime, sun shines, have daylight.	Sense of time.
15.	Egg-Seed	Embryonic substances, beginnings of life, young from both, first forms of life.	Give life, can create, have shells, something grows, both produce, reproduce (unexplained).	Grow, food, one comes from the other, you can eat both, have a yolk, are round.

Appendix IX.

Test Form I (continued)

	Item	2 points	1 point	0 points
16.	Honesty-Bravery	Traits of character, good traits, virtues, make up good character.	Both good, codes, outstanding, honorable, take will power.	Takes a brave man to be honest.
17.	Basket-Barrel	Containers, receptacles.	Hold things, contain things, carry in things, made of wood.	Round, have tops, openings, have handles.
18.	Salute-Handshake	Greeting, salutations, way of addressing, form of introduction.	Show of respect, recognitions, courtesy, friendship, done with the hand, means of saying hello.	Gestures.
19.	Sawdust-Straw	Waste, left-overs, by-products.	Bedding for animals, vegetable or plant matter, yellow.	Both wood.
20.	Rock-Water	Inanimate, natural substances.	Part of nature, heavy.	Both found in the ocean, both produce, part of God's creation.

Appendix X.

Scoring Criteria for Similarities

Test Form II

	Item	2 points	1 point	0 points
1.	Orange-Banana	Fruits,foods.	Both grow,have peels,eat both, have vitamins, to eat.	Round,same shape,contain calories.
2.	Oil-Gas	Fuel,petroleum products, sources of power,necessary for auto to run.	Burn,liquids, explosive, used in cars, inflammable, produce heat, fluid.	
3.	Ribbon-Lace	Decorations, trimmings, ornaments.	Cloth,pretty, women wear.	String,thread, yarn.
4.	City-Sate	Have system of gov't., division of area for jurisdiction,division of territory.	Have people, laws,boundaries,governed, a definite place.	On a map, piece of land, both have income tax laws.
5.	Cat-Mourse	Animals,mammals.	Have whiskers, legs,tails,are sneaky and quick.	Born enemies.
6.	Telephone-Letter	Means of communication, correspondence.	News,messages.	
7.	Factory-Farm	Both produce, means of production,both have products.	Businesses, people work there,make a living there, forms of work.	Both buildings, machinery.
8.	Poem-Statue	Works of art, artistic creations,expression of artistic feelings.	Beautiful things, stir feeling, symbolic,memorial,make you remember,tell stories,made by men,express emotions or ideas.	Poem describes a statue,by famous people,lifeless, you can read a poem and look at a statue,people like them,last a long time if good.

Appendix X.

Test Form II (continued)

	Item	2 points	1 point	0 points
9.	Iron-Silver	Metals, minerals.	Ore, mined, hard, make things from.	
10.	Doll-Ball	Toys, playthings, amusements, play objects.	Fun, play with.	Rhyme.
11.	Fan-Mattress	For comfort or ease, offer relief, things to make you comfortable.	Have metal in, help to relax, household articles.	Furniture, manufactured, appliances.
12.	Mountain-Lake	Parts of terrain, geographical features, natural features.	Scenery, part of earth's surface, part of nature, resorts there, part of the landscape.	Part of God's creation, part of outdoors, blue color.
13.	Canvas-Corduroy	Cloth materials, textiles, fabrics.	Make clothes, protect you, tough.	
14.	Recipe-Pattern	Instructions, directions, plans, formulas, guides.	Help to make things, follow them, women use.	Both paper.
15.	Fur-Bark	Protective coats for protection.	Covers, outer coat, tough, outer skin.	Pertain to a dog.
16.	Liberty-Justice	(Social) ideals, abstract concepts.	Deal with the rights of man, democratic principles, civil rights, give you a fair chance, symbols of our country, freedom, self-rights.	Both guarantied by our gov't., both in the U.S.A., to do what's right.

Appendix X.

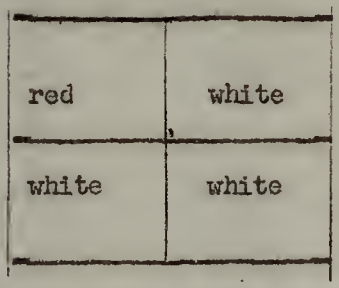
Test Form II (continued)

	Item	2 points	1 point	0 points
17.	Piano-Violin	Musical instruments, string instruments.	Play them both, make music, have strings, instruments, make sweet sounds, for entertainment.	
18.	March-May	Months.	Same number of days.	Both begin with M.
19.	Sunburn-Mumps	Ailments, illness, sickness, affliction.	Pain, swelling, redden.	Both affect the human anatomy, diseases.
20.	Fly-Tree	Have life, living things.	Breathe, created by nature, grow, need food, need sunlight.	Up in the air, fly has wings and tree has leaves, fly is small and tree is big, useful to man, carry germs, both high.

Appendix XI.

Designs Used in Block Design Task

1.



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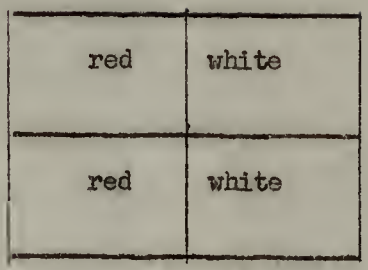

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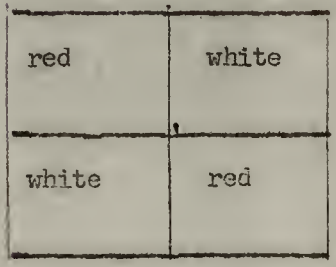

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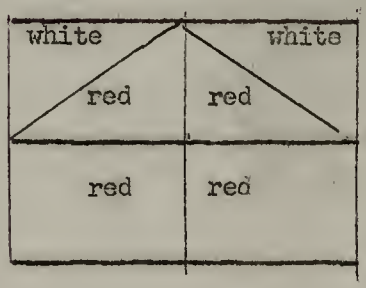

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